



Interval matrix differential equations

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(Submitted on 2 Apr 2012)

The matrix differential equation $x'(t) = Q(t)x(t)$, $x(0) = x_0$ is considered in the case where $Q(t)$ is an unspecified matrix function of time, with the only constraint that $Q(t) \in \mathcal{M}$ for every t , where \mathcal{M} is a prescribed closed and convex set of matrices. We provide the solution of the generalised equation by defining an exponential of a set of matrices. Although the definition is not directly applicable to calculate the solutions, we provide an approximate method along with the estimation of maximal possible error. In particular, the method allows estimating continuous time imprecise Markov chains.

Subjects: **Classical Analysis and ODEs (math.CA)**

MSC classes: 15B15, 15A16

Cite as: **arXiv:1204.0467 [math.CA]**

(or **arXiv:1204.0467v1 [math.CA]** for this version)

Submission history

From: Damjan Škulj [[view email](#)]

[v1] Mon, 2 Apr 2012 17:04:23 GMT (13kb)

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